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Solar Tracking Robot

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ABSTRACT

The aim if make the solar tracking robot Through the solar tracking system, we can produce an abundant amount of energy which makes the solar panel 's workability much more efficient. Perpendicular proportionality of the solar panel with the sun rays i s the reason lying behind its efficiency. Pecuniary, its installation charge is high provided cheaper options are also available. This paper is discussed all about the design and construction mechanism of the prototype for the solar tracking system having a single axis of freedom. The main control circuit is based upon NodeMcu microcontroller. Programming of this device is done in the manner that the LDR sensor, in accordance with the detection of the sun rays, will provide direction to the DC Motor that in which way the solar panel is going to revolve. Through this, the solar panel is positioned in such a manner that the maximum amount of sun rays could be received. In comparison with the other motors, DC motor is the simplest and the suave one, the torque of which is high and speed of which is slow enough. We can program it for changing the direction not with standing the fact that it rotates only in one direction subject to exception as far as programming is concerned. 1985, first time ever it was witnessed for production of the silicon

Key word: - Efficiently, Drvie, Robotics, Tracking,L298N

Introduction

Energy need day by day peoples at large. Each and every corner of our life is caged with various layers of impediment and in this response, energy is becoming an indispensable factor. Therefore, the source of energy needs to be endless/ perpetual in order to carry this colossal population ahead. Human beings being evolutionary in nature are perhaps the best ever creation of nature is always in the race of envisaging the probable and available comforts and benefits in every possible angle in this perilous world. The evidential matrix manifests that in a dichotomy of various opinions what options best expedite the scarcity of energy in an immensely heterogeneous society like ours. Our motto is to endeavour in forwarding such noble goal of energy conservation.

Many solar panels are mounted in a fixed position, for example on the roof of a house With no moving parts, this approach is sturdy and simple to build/maintain. However, solar panels produce the most power when they are perpendicular to the Sun's rays. This means that fixed-mount panels will produce less power early in the morning and late in the evening, due to the Sun's daily east-west motion through the sky. The amount of power they produce will also vary throughout the year due to seasonal north/south variation of the Sun's position. To help solar panels produce more power, they can be mounted on poles with motorized trackers that make the panels tilt to follow the sun.

Survey and Specification

Solar energy is very important means of expanding renewable energy resources. In this paper is described the design and construction of a microcontroller based solar panel tracking system. Solar is a non-conventional source of energy, considering this we have developed solar panels so that we can fulfillour electricity need. But due to revolution of the earth, solar source i.e. sun does not face the sun till it is present in a day. The problem above can be solved by our system by automatic tracking the solar energy. The block diagram below shows system architecture it consist of a LDR sensor senses max solar power which is being given to the microcontroller through the ADC which digitizes the LDR output.

This paper proposes a paper that involves an automated solar tracking system which will make use of LDR's to track the position of sun. The output of LDR's will be compared and analyzed to provide correct alignment of the solar panel. Also another tracking technique is being implemented along, which uses the relation of sun earth position at a given location. This telemetric data is given to microcontroller which will drive the motors to align the solar panel. This is useful during cloudy weather and rainy days when it is difficult to check the position of sun . Solar panels given output efficiency of around 15% to 20% based on the type of panel . The use of solar tracking system increases it to a range of about 30% to 35%.

Product Specification

Sr No	Name of resources	specification	Qauntity
1]	Supply voltage	12v	1
2]	Solar panel	1	1
3]	Arduino uno		1
4]	Pv cell		1
5]	wheels	suitable	2

Literature Review

Solar tracking system paper had been widely employed by the other giant company like BP Solar, Yingli Green Energy, Kyocera, Q-Cells, Sanyo, Sharp Solar, Solar World, Sun Power,and Suntech. Now, many people use solar energy or photovoltaic energy as an alternative power Because it's free and renewable. As we can see now, the payment charge for an electricity had Been risen rapidly because the increasing of gas price. Many researchers have tried to find the alternative energy to replace the gas. One of the alternative energy that we can use is photovoltaic energy. Photovoltaic energy is the most promising and popular form of solar energy. In solar photovoltaices,sunlight is actually converted into electricity. Photovoltaic power was first discovered by a French scientist s Antoinc Becquerel in 1839. The first working solar cell was successfully made by Charles frits in 1882. It was made of thin sheets of selenium and coated with gold. The use of solar panels for generating electricity and heat seems relatively like new development, it has actually been widely used to generate Power since early 1900s. In 1954 bell laboratory mass produced the first crystal silicon solar Cell. The bell PV cell converted 4% of the Sun s energy into electricity a rate that was considered.

The cutting edge in energy technology.Scientists continued to reinvent and enhanced on the design of the original silicon cell land were able to produce a solar cell that was capable of putting 20% return electricity rate. In The late 1900s as awareness grew in the science community about the effects of global warming And the need for renewable energy sources, scientists continued to refine the silicon PV and biyearly 2000 they were able to make a solar cell with 24% electricity return. In just seven years scientists were again able to increase the electricity return of silicon solar cell using space age materials. By 2007, modern silicon PV solar cells were operating with 28% electricity return.Each photovoltaic cell produces a small amount of electricity so they are wired together.

Discussion and Methodology

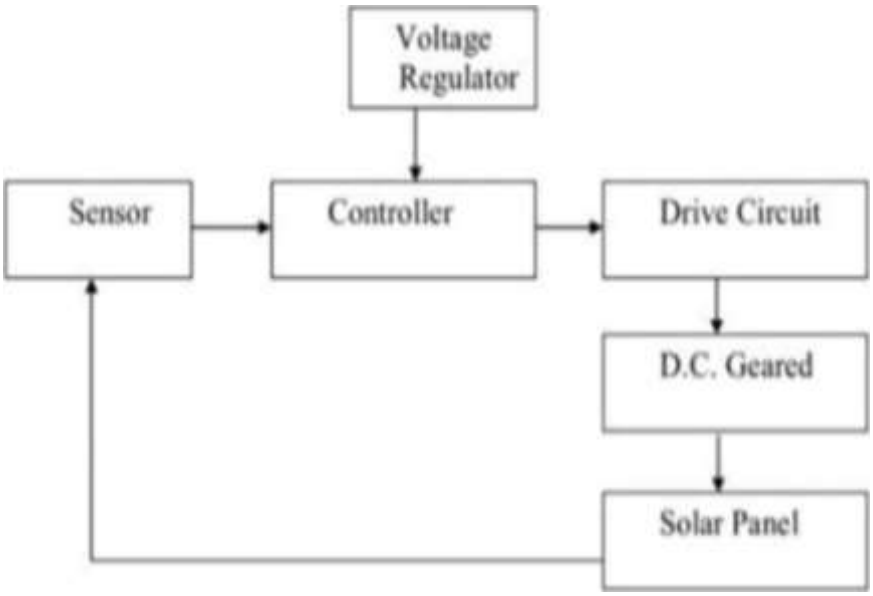

Figure 1. Block diagram of automatic tracker

The paper called "Automatic Solar Tracking System" is produced through installation of the various nitty-gritty such as solar panel which provides 12 volts as output, an NodeMcu as MCU, a motor driver with IC L293D, two LDR sensor module, a 10 r.p.m. simple DC motor, a current sensor and a 9 V battery. Construction of the said project is being built out of the wooden base installed at the ground of it, affixed with the iron rods on both the sides in a cross-shaped manner connected with a hollow cylindrical rod from both the sides and the DC motor is clinging at one edge of the hollow rod. Threefold sections into which the circuit of the solar tracking system is divided.The system's microcontroller is programmed using the Arduino ide software, two LDR modules are organised in the input stage to create a voltage divider circuit, and a DC motor in the drive circuit aids in the rotation of the solar panel. Three terminals are included with the motor driver: two are used for motor input and output, and the third is used for power input. Two of the Arduino

UNO's fourteen digital input/output pins are linked to the motor input terminal, and the DC motor is connected to the motor output terminal after that. contains two LDR modules arranged to create a voltage divider circuit; the microcontroller is programmed using the Arduino software that is installed in the system; and finally, the drive circuit, which includes a DC motor to assist in rotating the solar panel, is included.

Three terminals are included with the motor driver: two are used for motor input and output, and the third is used for power input. Two of the Arduino UNO's fourteen digital input/output pins are linked to the motor input terminal, and the DC motor is connected to the motor output terminal after that.

Conclusion

In the current work, an Arduino solar tracker was created and built. The intensity of the solar light event on the photovoltaic cell panel was detected using LDR light sensors. The paper's conclusions can be summed up as follows: the light source, whether it be a tiny torch light in a dark room or the sun's rays, was successfully sketched by the current tracking method. This solar tracker is appropriate for use in rural areas due to its affordability and dependability. The rationale behind renewable energy This report provided innovative and cutting-edge suggestions to assist the people.

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